

REMARKS

Claims 1-9 and 17-25 are now pending in the application. Claims 1-5, 7-9 and 17-24 stand rejected; and Claim 6 is objected to. Withdrawn Claims 10-16 have now been cancelled and Claim 25 is new. The specification is also objected to. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

SPECIFICATION

The specification stands objected to because of certain informalities, specifically regarding the reference to the terms “turbine fan” and “fan.”

Though the Office Action provides a single and narrow definition for each of these terms, the Applicants do not readily agree with such limited definitions. Nevertheless, Applicants have amended the specification according to the Examiner’s suggestion to replace “turbine fan” and “fan” with ~~–turbine–~~ or ~~–turbine blade–~~, as appropriate to expedite prosecution. Therefore, reconsideration and withdrawal of these objections are respectfully requested.

CLAIM OBJECTIONS

Claims 1-9 are also rejected because of the above informalities. Despite Applicants’ disagreement with the Examiner’s limited definitions, Applicants have, nevertheless, also non-narrowingly amended the claims according to the Examiner’s suggestion. Therefore, reconsideration and withdrawal of this objection are also respectfully requested.

REJECTION UNDER 35 U.S.C. § 112

Claims 6 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention. Applicants have amended Claim 6 to overcome this informality. Reconsideration and withdrawal of this rejection are respectfully requested.

Claim 16 has been cancelled and the rejection thereto rendered moot. Therefore, reconsideration and withdrawal of this rejection are respectfully requested.

REJECTION UNDER 35 U.S.C. § 102

Claims 1,2, 8, and 9 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Smits (U.S. Pat. No. 2,811,676; hereinafter "Smits"). This rejection is respectfully traversed.

At the outset, Applicants note that independent Claim 1 has been amended to now recite:

a turbine powered by the expanding gasses;
and

an ignition system to provide substantially simultaneous ignition of each of the plurality of the combustors,

said ignition system including a combustion wave chamber to form a detonation wave that can be transmitted through an ignition line with at least one of a selected oxidizer and a selection fuel.

Applicants respectfully assert that at least these features as claimed are not disclosed or fairly suggested by Smits.

Smits appears to disclose an ignition system for a jet engine using nine combustion chambers each with a surface discharge spark plug 2 (see at least Column 3, lines 24-31). In order to ignite the engine in Smits, each of the spark plugs 2 are discharged to create an atomizing spark, and then a condenser 4 discharges to create a second spark that ignites the fuel (see at least Column 4, lines 15-34). Smits does not disclose whatsoever an ignition system configured to form a detonation wave, as presently claimed.

Accordingly, Applicants respectfully assert independent Claim 1 is patentable over Smits and in condition for allowance. In addition, as Claims 2, 8 and 9 depend from independent Claim 1, Applicants respectfully submit these claims are also patentable and in condition for allowance.

Reconsideration and withdrawal of this rejection are respectfully requested.

REJECTION UNDER 35 U.S.C. § 103

Claims 1-3, 8 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Jubb et al. (U.S. Pat. No. 2,722,800; hereinafter "Jubb") in view of Smits. Claims 1-5, 7-9 and 17-24 are rejected as being unpatentable over Jones et al. (U.S. Patent No. 3,009,321; hereinafter "Jones") in view of Gemmen et al. (U.S. Patent No. 5,791,889; hereinafter "Gemmen") and/or Winfree et al. (U.S. Patent No. 5,937,635; hereinafter "Winfree"). These rejections are respectfully traversed.

At the outset, Applicants again note that independent Claim 1 has been amended to now recite:

a turbine powered by the expanding gasses;
and

an ignition system to provide substantially simultaneous ignition of each of the plurality of the combustors,

said ignition system including a combustion wave chamber to form a detonation wave that can be transmitted through an ignition line with at least one of a selected oxidizer and a selection fuel.

Applicants also note that independent Claim 17 recites:

forming a detonation wave;

transmitting the detonation wave to at least one of the main combustion chambers;

at least one of providing and flowing a selected volume of a pilot oxidizer and a pilot fuel to the main combustion chamber;

Applicants respectfully assert that at least these features as claimed are not disclosed by Jubb, Smits, Jones, Gemmen or Winfree

Applicants respectfully refer the Examiner to the remarks above regarding Smits. With regard to Jubb, Applicants note that Jubb does not disclose whatsoever the use of a detonation wave. Rather, Jubb appears to disclose the use of a pilot flame to ignite main combustor chambers 12 where a temperature based ignition system controls the supply of fuel to the jet engine (see at least Column 3, lines 35-50, and Column 4, lines 63-70). Thus, Applicants respectfully assert neither Jubb nor Smits, either alone or in combination, teach the features recited in Applicants' Claim 1.

With regard to the combination of Jones, Gemmen and Winfree, Applicants respectfully assert that neither Jones, Gemmen or Winfree teach or suggest Applicants' each of the elements of Claims 1 and 17. None of Jones, Gemmen or Winfree disclose whatsoever the transmission of a detonation wave through an ignition line with a

reactant or the providing or flowing of a reactant with a detonator wave to a main combustion chamber. Rather, Jones appears to disclose a combustion section 10 with a plurality of combustion chambers 12 that are ignited in pairs by pilot chambers 14 (see at least Column 1, lines 59-65). The pilot chambers 14 are ignited via one spark plug 46, and the flame propagates through the pilot chambers 14 and tubes 16, 18 to the combustion chambers 12 (see at least Column 1, lines 65-73 and Column 2, lines 1-2). Jones is silent as to either a detonation wave or the flow of reactants to a main combustor.

In addition, Applicants respectfully assert that it is improper to modify Jones to include such features, as it would improperly modify the intended use of Jones. Specifically, if proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900,221 USPQ 1125 (Fed. Cir. 1984), MPEP 2143.01. Jones discloses the importance of the igniter being formed with hot ceramic linings (see at least Column 1, lines 30-33). Applicants believe that the ceramic linings described in Jones may not be able to withstand the thermal shock created by a detonation wave, as recited herein.

With regard to Gemmen and Winfree, neither Gemmen nor Winfree remedy these shortcomings of Jones. Gemmen appears to disclose only short pulses 23 of hot combustion gases to light the reactants in a combustion zone 22 (see at least Column 7, lines 40-43), and not a detonation wave. Winfree appears to disclose a pulse detonation engine 11 that employs multiple pulses of reactants to create a detonation (see at least Column 2, lines 20-23 and 43-67). Winfree does not disclose whatsoever

providing a selected volume of an oxidizer and a reactant at the main combustion chamber or through an ignition line, as claimed in Applicants' Claims 1 and 17.

Accordingly, as neither Jubb, Smits, Jones, Gemmen or Winfree teach or suggest each and every element of Applicants' Claims 1 and 17, Applicants respectfully submit Claims 1 and 17 are patentable and in condition for allowance. In addition, as Claims 2-5, 7-9, and 18-24 depend from either independent Claim 1 or 17, Applicants respectfully submit these claims are also patentable and in condition for allowance.

Reconsideration and withdrawal of these rejections are respectfully requested.

ALLOWABLE SUBJECT MATTER

The Examiner states that Claim 6 would be allowable if rewritten in independent form. Applicants have added new Claim 25 to include the allowable subject matter of Claim 6 and the subject matter of Claim 1. Thus, Applicants respectfully submit that Claim 25 is allowable.

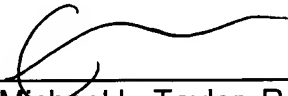
CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner

believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: 2/10/06

By: 
Michael L. Taylor, Reg. No. 50,521
Erica K. Schaefer, Reg. No. 55,861

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

EKS/lf-s

G:\eschaefer\6679\000039 (fka 7784-660)\Amendment due 2-10-06\Amendment.doc